**CODELANDCS BLOCKCHAIN DEVELOPMENT SYLLABUS**

**WEEK 8**

**DAY 2**

**IPFS AND HOSTING ON IPFS**

In today's digital age, there is a massive amount of data being generated every second. This data is stored on **servers** and **cloud-based platforms**, making it vulnerable to hacking and data breaches. To tackle this issue, a new decentralized and distributed data storage system was introduced, known as **IPFS (InterPlanetary File System)**. IPFS is a revolutionary new technology that has the potential to change the way we store and share data on the internet.

**What is IPFS?**

IPFS is a peer-to-peer distributed file system designed to create a permanent and decentralized method of storing and sharing files on the internet. IPFS allows users to access and store files **without relying on a centralized server**, instead of using a distributed network of computers to host and retrieve files. This means that files are no longer stored on a single server, but instead are distributed across the network. IPFS has a unique way of addressing files, **using a content-addressing scheme**, which enables data integrity and tamper-evident guarantees.

**Advantages of IPFS:**

**Decentralized**: IPFS is a decentralized network, which means that files are not stored on a single server but are distributed across the network. This makes it **impossible for a single point of failure**, and it also reduces the risk of data breaches.

**Faster Downloads**: IPFS uses a content-addressing scheme, which means that **files are uniquely identified by their content**, rather than their location. This allows files to be downloaded from multiple sources simultaneously, resulting in faster download times.

**Reducing Bandwidth Usage**: IPFS uses a **peer-to-peer network**, which means that **users can download files from other users on the network**, rather than downloading files from a central server. This reduces the bandwidth usage and saves costs.

**Data Integrity**: IPFS uses a content-addressing scheme, which ensures that files are tamper-evident and have data integrity. This means that any changes to the file will result in a different hash, and the changes can be detected easily.

**Permanent Storage**: IPFS provides permanent storage for files. Files are stored on the network indefinitely, as long as at least one node is hosting them. This ensures that files are always available, even if the original uploader goes offline.

**How IPFS works:**

IPFS nodes hashes our data to spit out a unique string that would be used to uniquely identify our data. Thereafter, we can choose to pin that data on to our node for reference.

Our node is connected to a network of nodes that all commuincate with each other. So when a request for a hash is received on the network, all the nodes communicate with each other to find out the node(s) in possession of such hash.

The other nodes can choose to pin a copy of our hash onto their own node making the whole system completely decentralised.

**HOSTING ON IPFS**

There are number of ways to work with IPFS

* By downloading the desktop application
* Through the command line interface
* By adding IPFS to the browser as a companion

**DESKTOP APPLICATION**

* Install the IPFS Desktop application in our machine.
* Once installed, click on the box icon on the desktop.
* Go to the files menu to be directed to the files section.
* Import the desired file.
* Copy the CID which would be used as IPFS url.
* Pin file to your node

But before then, the react application should be built to an optimized production build because IPFS cannot render a non static file.